DECISION DOCUMENTATION PACKAGE
COVER SHEET

PREPARED IN ACCORDANCE WITH

TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY SITES
AT INEL

SITE DESCRIPTION: Underground Storage Tank CFA-674S
SITE ID: CFA-34 **OPERABLE UNIT:** 04-03
WASTE AREA GROUP: 4

I. SUMMARY - PHYSICAL DESCRIPTION OF THE SITE:

Site CFA-34 is the historical site of a 260-gal underground storage tank designated as CFA-674S. The tank was installed within 1 ft of the southwest corner of Building CFA-674. The actual date of installation is not known, but the building utilizing the tank was built in the early 1950s. The tank is assumed to have been abandoned in 1976 and was used to store #2 diesel fuel oil to heat the building. The remaining tank contents were removed in October 1990, leaving less than 0.5 in. in the tank for the removal process.

In October 1990 the tank was removed from the site following EG&G Idaho Tank Management Program (TMP) procedures. The tank was found to have several large holes and to have leaked some of its contents to the surrounding soil. The areas of contamination were determined visually as well as by field screening volatile organic compounds (VOCs) with a Photovac Microtip photoionization detector (PID). The EG&G Idaho field action level has been established at 50 mg/kg for diesel-contaminated soils. Soil exceeding this limit was removed from the excavation and taken to the Central Facilities Area (CFA) landfill for landfarming. Approximately one and one-half truckloads (approximately 18 yd^3) of contaminated soil were removed. VOCs monitoring continued until levels below 50 mg/kg were detected and the excavation was backfilled to grade with noncontaminated soil as directed by the TMP tank removal procedures.

Prior to backfilling, five biased soil samples were collected by EG&G Idaho Environmental Technology Unit personnel and sent to Data Chem Laboratories of Salt Lake City, UT for laboratory analysis of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and xylene (BTEX). Preliminary screening of these samples with the Microtip PID detected levels of VOCs ranging from 15.5-29.2 mg/kg. Laboratory analysis of the soil samples detected low levels of TPH ranging from 30-290 mg/kg, below the State of Idaho maximum allowable of 1000 mg/kg for diesel-contaminated soils. TPH were not detected in the fifth sample and BTEX were not detected in any of the samples. These results suggest that a low level of TPH may still be present at the site, but below regulatory action levels and therefore, the site should be reclassified to "no-action" status.

NO FURTHER ACTION DETERMINATION

The U. S. Department of Energy, U. S. Environmental Protection Agency-Region 10 and the State of Idaho have completed a review of the referenced information for Central Facilities Area (CFA) -34 hazardous site, as it pertains to the INEL Federal Facility Agreement of December 4, 1991. Based on this review, the parties have determined that no further action for purposes of investigation or study is justified. This decision is subject to review at the time of issuance of the Record of Decision.

Brief Summary of the basis for no further action:
Data indicates only residual levels of contamination exist.

References:
Data Chem Analytical Report, 1/6/93

DOE Project Manager _____ 1/6/93 Date

EPA Project Manager _____ 1/6/93 Date

Idaho Project Manager _____ 1/6/93 Date

DECISION RECOMMENDATION

II. SUMMARY - QUALITATIVE ASSESSMENT OF RISK:

The information gathered is determined reliable and the qualitative risk assessment concluded low. Determination of the tank contents, removal of the contents, and removal of the tank were done following established procedures with no deviations or unusual occurrences. Therefore, using the Qualitative Risk and Reliability Evaluation Table, it is concluded that no further action is required for CFA-34.

III. SUMMARY - CONSEQUENCES OF ERROR:

If a decision is made in error to close CFA-34, the possibility exists for migration of contaminants to groundwater. The potential contaminants include total petroleum hydrocarbons, benzene, toluene, ethylbenzene, and xylene. If not all of the contaminated soil was removed during the tank removal process, the contaminants may still be present and could potentially migrate to the groundwater, posing a risk to human health and the environment.

If the decision is made in error to further remediate CFA-34, realized benefits would be minimal relative to the high investment in remediation expenditures.

IV. SUMMARY - OTHER DECISION DRIVERS

No other decision drivers are apparent for CFA-34.

RECOMMENDED ACTION:

It is recommended that COCA Site CFA-34 be reclassified to "no-action" status and be removed from the list of INEL solid waste management units. Biased soil samples taken from the excavation were found to contain TPH concentrations ranging from 30-290 mg/kg. Consequently, TPH may still exist at the location but at levels below the State of Idaho maximum allowable of 1000 mg/kg for diesel contaminated soil. BTEX were not detected in any of the soil samples. Based on this and other existing data, the risk that this site poses has been assessed to be low.

SIGNATURES	# PAGES:	DATE: 1/7/92
Prepared By: J. Bell	DOE WAG Manager:	
Approved By:	Independent Review: Shannon Watt	

DECISION STATEMENT
(BY DOE RPM)

DATE RECD: 1/6/93

DISPOSITION:

Tank emptied, removed, contaminated soils removed to below field action levels, soil samples below state max. allowable. Residuals do not pose unacceptable risk – no action required

DATE: 1/6/93	**# PAGES (DECISION / STATEMENT)**
NAME: J. Lytle	**SIGNATURE:**

DECISION STATEMENT
(BY EPA RPM)

DATE RECD: 1/6/93 CFA 34

DISPOSITION:

CFA 647 S Tank. Tank disposition form shows evidence of holes (contrary to summary Assessment). Diesel #2 (weathered) observed & analyzed in tank. liquid level of tank at 29" (estimate 260 gal). BTEX sampling of soil (6 samples) were N.D. Approximately 1.5 Truckloads of contaminated soil removed. PID levels under 50 ppm afterwards. No further action recommended.

DATE: 1/6/93	**# PAGES (DECISION STATEMENT)** 1
NAME: Wayne Pierce	**SIGNATURE:** Wayne Pierce

DECISION STATEMENT
(BY STATE RPM)

DATE RECD: 1/6/93 CFA-34

DISPOSITION:

Based on soil sample results obtained following soil removal and tank removal indicates that TPH was found at .29 mg/g and no detection for BTEX. These data as reported in the Data Chrom Analysis report dated Oct. 17, 1990. These data indicate that contamination was removed to residual levels that would not pose an unacceptable risk to human health.

No further action is required.

DATE: 1/6/92	**# PAGES (DECISION STATEMENT)**
NAME: Dean T. Nygaard	**SIGNATURE:** Dean T. Nygaard

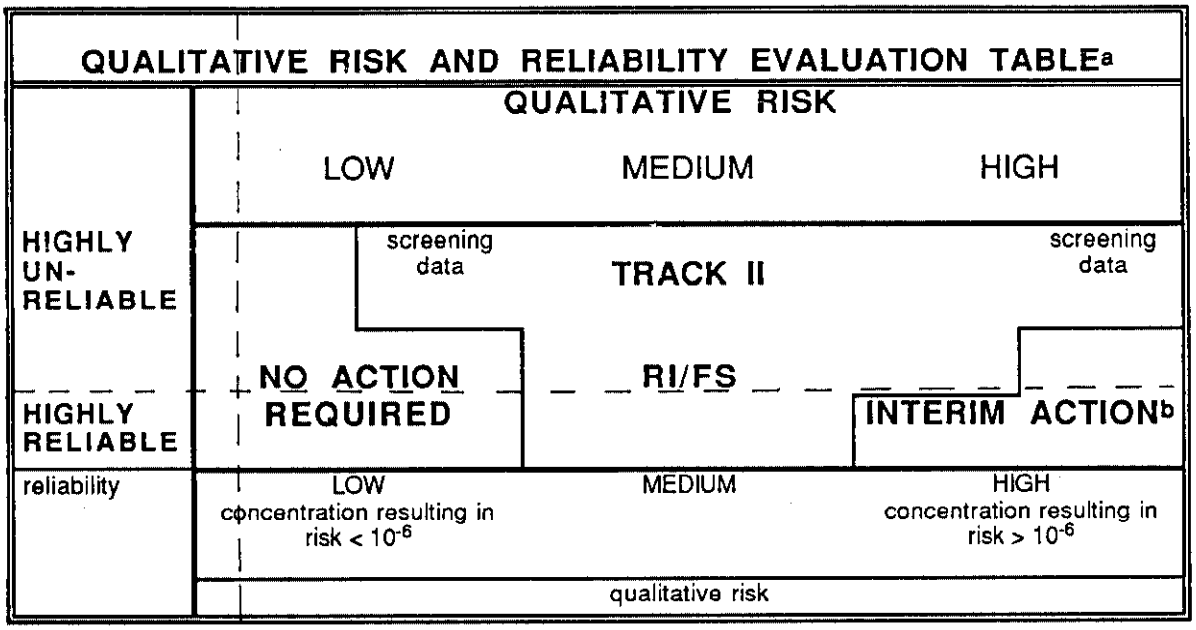
PROCESS/WASTE WORKSHEET
SITE ID CFA-34

col 1 Processes Associated with this site	col 2 Waste Description & Handling Procedures	col 3 Description & Location of any Artifact/Structures/Disposal Areas Associated with this Waste or Process
Process Diesel fuel storage in an underground storage tank CFA-674S		Artifact Underground storage tank Location Located within 1 ft southwest of CFA-674 Description 260 gal steel tank
		Artifact Associated piping Location Now removed, previously located within 1 ft southwest of CFA-674 Description Tar-coated steel piping
		Artifact Location Description
Process Removal of underground storage tank CFA-674S	Approx. 290 gal of #2 diesel fuel oil recovered by H&M Oil of Pocatello, ID #2 diesel fuel oil-contaminated soil	Artifact Underground storage tank Location Now removed, previously located within 1 ft southwest of CFA-674 Description 260 gal steel tank
		Artifact Associated piping Location Now removed, previously located with tank southwest of CFA-674 Description Tar-coated steel piping
		Artifact Contaminated soil Location Now removed, previously located at excavation southwest of CFA-674, taken to the CFA landfill for landfarming Description Approximately 18 yd^3 of stained soil
Process		Artifact Location Description
		Artifact Location Description
		Artifact Location Description

CONTAMINANT WORKSHEET
SITE ID CFA-34
PROCESS (col 1) UST Removal **WASTE** Soil

Col 4 What known/potential hazardous substances/constituents are associated with this waste or process?	Col 5 Potential sources associated with this hazardous material?	Col 6 Known/ estimated concentrations of hazardous substances/ constituents[a]	Col 7 Risk based concentration mg/kg	Col 8 Qualitative risk assessment (Hi/Med/Lo)	Col 9 Overall reliability (Hi/Med/Lo)
Benzene[b]	Contaminated Soil	ND, DL = 0.05*	---[d]	Low	High
Toluene[b]	Contaminated Soil	ND, DL = 0.05*	---[d]	Low	High
Ethylbenzene[b]	Contaminated Soil	ND, DL = 0.05*	---[d]	Low	High
Xylene[b]	Contaminated Soil	ND, DL = 0.1*	---[d]	Low	High
TPH[c]	Contaminated Soil	30-290 mg/kg	---[e]	Low	High

a. ND = not detected
DL = detection limit in mg/kg
b. Analyses performed using EPA Method SW-846-8020.
c. Analysis performed using the California Department of Health Services Method.
d. --- = No risk assessment performed based on the ND result.
e. Risk assessment not calculated for TPH.
* Concentration converted from ug/g to mg/kg.



a. For all potential contaminants.

b. If there exists sufficient data to identify an appropriate remedy.

Question 1. What are the waste generation process locations and dates of operation associated with this site?

Block 1 Answer:

COCA site CFA-34 is the site of a removed underground storage tank designated as CFA-674S. Conflicting information exists regarding the tank capacity. Early records indicate a capacity of 1,000 gal, later records suggest 300 gal, and when the contents of the tank were removed prior to tank excavation, records state an estimated 290 gal of liquid were removed from the tank. However, upon removal, tank dimensions were used to calculate an actual capacity of 260 gal. The tank installation date is not known, but it was installed at the southwest corner of Building CFA-674 which was built in the early 1950s. The tank was used for storing fuel oil used to heat the building and is believed to have been abandoned in 1976. Building CFA-674 is currently used as a warehouse with a photographic laboratory located in the south end.

A ground penetrating radar (GPR) survey was performed at this location which shows that the tank was approximately 1 ft from the building, at a depth of 3 ft with a vent pipe at the building. A map of the tank location and the GPR survey results are attached. The tank was constructed of steel with no internal protection but painted externally for protection and the associated piping was constructed of tar-coated steel.

Block 2 How reliable is/are the information source/s? _High X Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information was obtained from personnel involved in the operation of the tank, content sampling, and tank removal.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

The location, size, and condition of the tank were verified upon removal of the tank.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	9, 12			

Question 2. What are the disposal process locations and dates of operation associated with this site? How was the waste disposed?

Block 1 Answer:

In May 1989, the contents of the tank were sampled by EG&G Idaho Environmental Science and Technology personnel for waste profile analysis. The level of liquid in the tank was measured at 29 in. The sample was analyzed by the EG&G Idaho Environmental Chemistry Unit and determined to be weathered #2 diesel fuel oil. In addition, the sample was analyzed for chlorinated hydrocarbons by Titrimetric method; none were detected. In October 1989, the tank contents were removed. Records indicate an estimated 290 gal of fuel oil were removed from the tank, resulting in less than 0.5 in. left in the tank. This volume conflicts with the actual capacity of the tank (as stated previously, actual tank dimensions were used to calculate a capacity of 260 gal), but it is noted that the quantity of fuel removed was recorded as an estimate. Records did not reveal who removed the tank contents, but it is presumed removal was performed by H&M Oil of Pocatello, Idaho because this company had a contract for the work during this time period.

Removal of the tank occurred October 17, 1990 following EG&G Idaho Tank Management Program removal procedures. Monitoring and sampling for contamination was conducted by EG&G Idaho Environmental Technology Unit personnel following an EG&G Idaho approved sampling and analysis plan for tank removal. A soil sample was collected for every 5 m^3 of soil removed and screened with a Photovac Microtip photoionization detector (PID) for VOCs. Samples were screened and VOC levels were determined to be below the EG&G Idaho field action level of 50 mg/kg for diesel-contaminated soils. Upon removal, several large holes were observed in the tank so excavation continued until VOC readings were below the EG&G Idaho field action levels. One and one-half truckloads (approximately 18 yd^3) of contaminated soil were removed and transported to the CFA landfill for landfarming. Five biased soil samples were collected from the excavation under the tank at a depth of 8 ft and sent to an independent laboratory for analysis. Upon collection, these samples were field-screened for VOCs and found to be well below the EG&G Idaho field action levels. Sampling locations are shown on the attached diagram. Piping leading to the building was capped and left in place while tank piping was removed. Based on the low VOCs detected, the excavation was determined acceptable for backfilling and done with noncontaminated soil as directed by TMP procedures. The Tank Removal Summary states the soil was obtained from the INEL gravel pit.

The soil samples were analyzed by Data Chem Laboratories of Salt Lake City, UT. No BTEX were found in any of the samples. Laboratory detection limits for benzene, ethylbenzene, and toluene are 0.05 mg/kg and 0.1 mg/kg for xylene. Of the five samples, four were found to contain low levels of TPH ranging from 30-290 mg/kg, below the State of Idaho maximum allowable of 1000 mg/kg. The fifth sample did not contain TPH. The laboratory detection limit for TPH is10 mg/kg.

The tank was cut into smaller pieces and shipped with three pieces of piping to Pacific Steel of Idaho Falls, Idaho for disposal in November 1990.

Block 2 How reliable is/are the information source/s? X High _Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

This information was obtained from records documenting the removal process.

Question 2. What are the disposal process locations and dates of operation associated with this site? How was the waste disposed? (Continued)

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)
IF SO, DESCRIBE THE CONFIRMATION.

The documents from which the information was obtained are considered records of the removal process.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	3,4
Anecdotal	[X]	11	Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[X]	6
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[X]	5	Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1,8			

Question 3. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

Migration was observed as dark stains in the soil of the excavation and detected with a Photovac Microtip PID during removal of the tank.

Block 2 How reliable is/are the information source/s? X High _Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information was obtained from sampling logbooks documenting the removal process.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Laboratory analytical results of soil samples confirm the field screening results of migration.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	4
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1			

Question 4. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

No evidence exists suggesting that a source is present at this site today. The tank was removed from the site and any contaminated soil was also removed. Laboratory analyses indicated levels of TPH in four of the five samples submitted for analysis, ranging from 30-290 mg/kg, below the maximum allowable of 1000 mg/kg established by the State of Idaho. No BTEX were detected in any of the soil samples.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information was obtained from field sampling logbooks and laboratory analytical data.

Block 3 Has this INFORMATION been confirmed? __Yes _X_No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Laboratory results have not been validated to confirm the presence of TPH.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	3
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1,8			

Question 5. Does the site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

Contamination would probably occur as a hot spot around a leak in the tank.

Block 2 How reliable is/are the information source/s? X High _Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

This information is based on past experience with underground storage tanks.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Contamination was observed as an area of stained soil around a leak in the tank.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1			

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

Using the GPR survey as a guideline for the dimensions and the calculated capacity of the tank, the length of the contaminated region was estimated to be 7 ft, and the width and depth each 3 ft. With the type of contaminant (i.e., #2 diesel fuel oil) and the maximum capacity of the tank (i.e., 260 gal) as an estimated spill size, an estimated volume of the source was calculated using a model developed by EG&G Idaho (attached). 350 yd^3 of soil is considered the estimated volume of the source, however, any contaminated soil (the source) was removed and as a consequence, no source presently exists.

Block 2 How reliable is/are the information source/s? _High X Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Tank volume is known and the model was developed using documented values. The GPR survey, however, does not coincide with the known capacity of the tank and therefore the overall conclusion is that the information is only moderately reliable.

Block 3 Has this INFORMATION been confirmed? _Yes X No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	4
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	9, 10,14			

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

Assuming that the source was not removed, an estimated 260 gal of hazardous constituent would be present. In actuality, the source was removed with the one and one-half truckloads (approximately 18 yd^3) of contaminated soil. Laboratory analytical results indicate that a level of TPH was found in the soil sampled from beneath the tank but below the State of Idaho action levels of 1000 mg/kg for diesel-contaminated soil.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information was obtained from documentation recorded during the removal process and from laboratory analytical results of the soil samples.

Block 3 Has this INFORMATION been confirmed? __Yes _X_No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Laboratory analytical results have not been validated.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	3
Anecdotal	[X]	11	Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	10			

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

Any contamination at this site was presumed to be removed based on visual inspection and Photovac Microtip PID screening during the removal process. Laboratory analytical results show that some TPH was present in the samples taken from the soil beneath the tank, ranging in concentration from 30-290 mg/kg. TPH may still be present at the site but at levels below the State of Idaho action level of 1000 mg/kg for diesel-contaminated soil. No BTEX were detected in any of the samples.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information was obtained from logbooks documenting the removal process and from laboratory analytical results.

Block 3 Has this INFORMATION been confirmed? __Yes _X_No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Laboratory analytical results have not been validated.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	3
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Aerial photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1,8			

REFERENCES

1. Daniel, V. E., EG&G Idaho, Inc. Environmental Technology Sampling Logbook, pp. 1-2, 4-6, dated October 17, 1990.

2. Daniel, V. E., Tank Removal Summary for CFA-674-S, February 1, 1991.

3. Data Chem Laboratories, Analytical Report, dated November 5, 1990.

4. EG&G Idaho, Inc. Environmental Chemistry Analytical Report, ROA #119, dated July 31, 1989.

5. EG&G Idaho, Inc. photographs.

6. EG&G Idaho, Inc. Tank Disposition Form, Tank CFA 674, dated December 15, 1990.

7. EG&G Idaho, Inc. Tank Management Program Removal Procedures for UST, Tank Number CFA 674-S

8. Gitt, M. J., Sampling & Analysis Plan for Site Assessment during the Closure or Replacement of Nonradioactive Underground Storage Tanks, EGG-ESQ-9116, August 1990.

9. Hanson, L., T. Brunson, P. Evans, Ground Penetrating Radar for CFA 674-S, Tape ID. 00011, EG&G Idaho, Inc. INEL Underground Storage Tank Location Project, dated September 20, 1991.

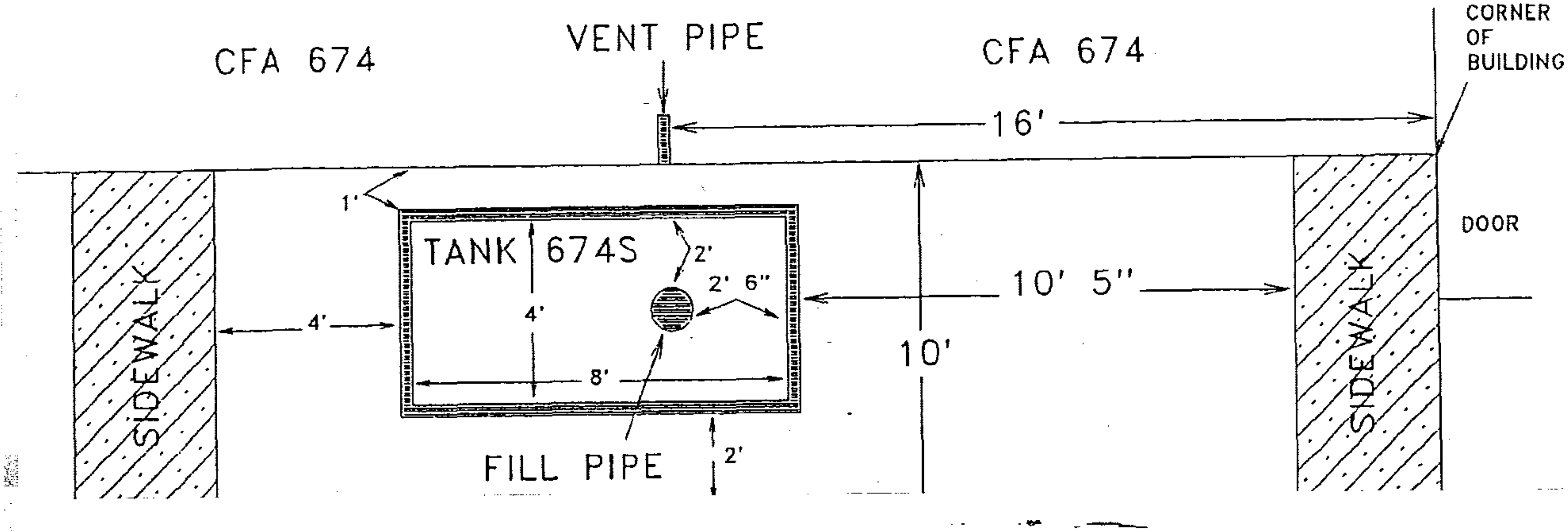
10. Hood, D. N. ltr to J. E. Coody, Status of UST Cut Down at the CFA Facility for Week Ending 12/7/90, DNH-6-91.

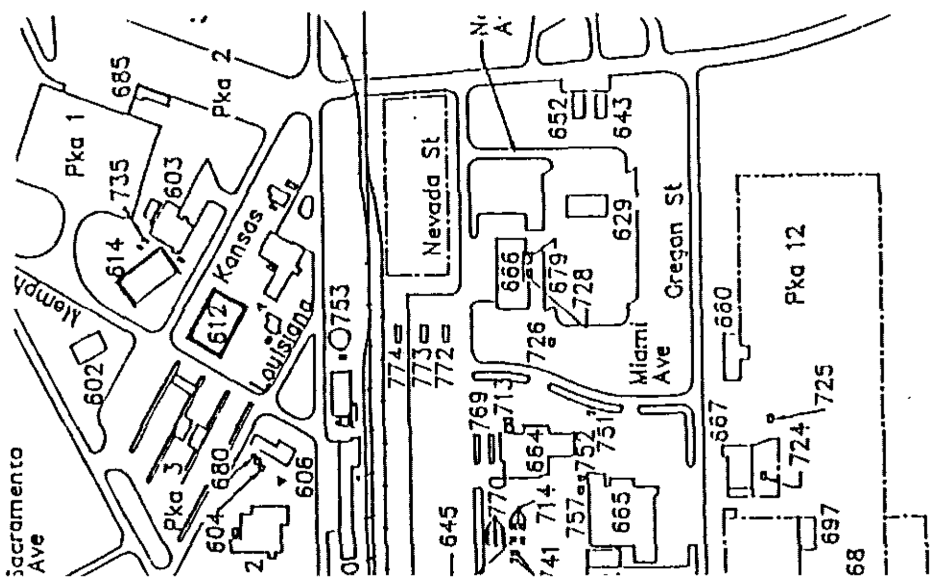
11. Hood, D. N., personal communication, January 7, 1992.

12. Installation Assessment for EG&G Idaho Operations at the INEL, EGG-WM-6875, January 1986.

13. Permann, P. J., Environmental Science and Technology Sampling Logbook, pp. 0043, 0044-0045, dated May 22, 1989.

14. Rood, A. S., Estimation of Volume of Contaminated Soil from a Fuel Oil Spill, August 7, 1991.


CFA 674
VENT PIPE
CFA 674
CORNER
OF
BUILDING
16'
1'
TANK 674S
2'
2' 6"
10' 5"
DOOR
SIDEWALK
4'
4'
8'
10'
SIDEWALK
FILL PIPE
2'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666
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728
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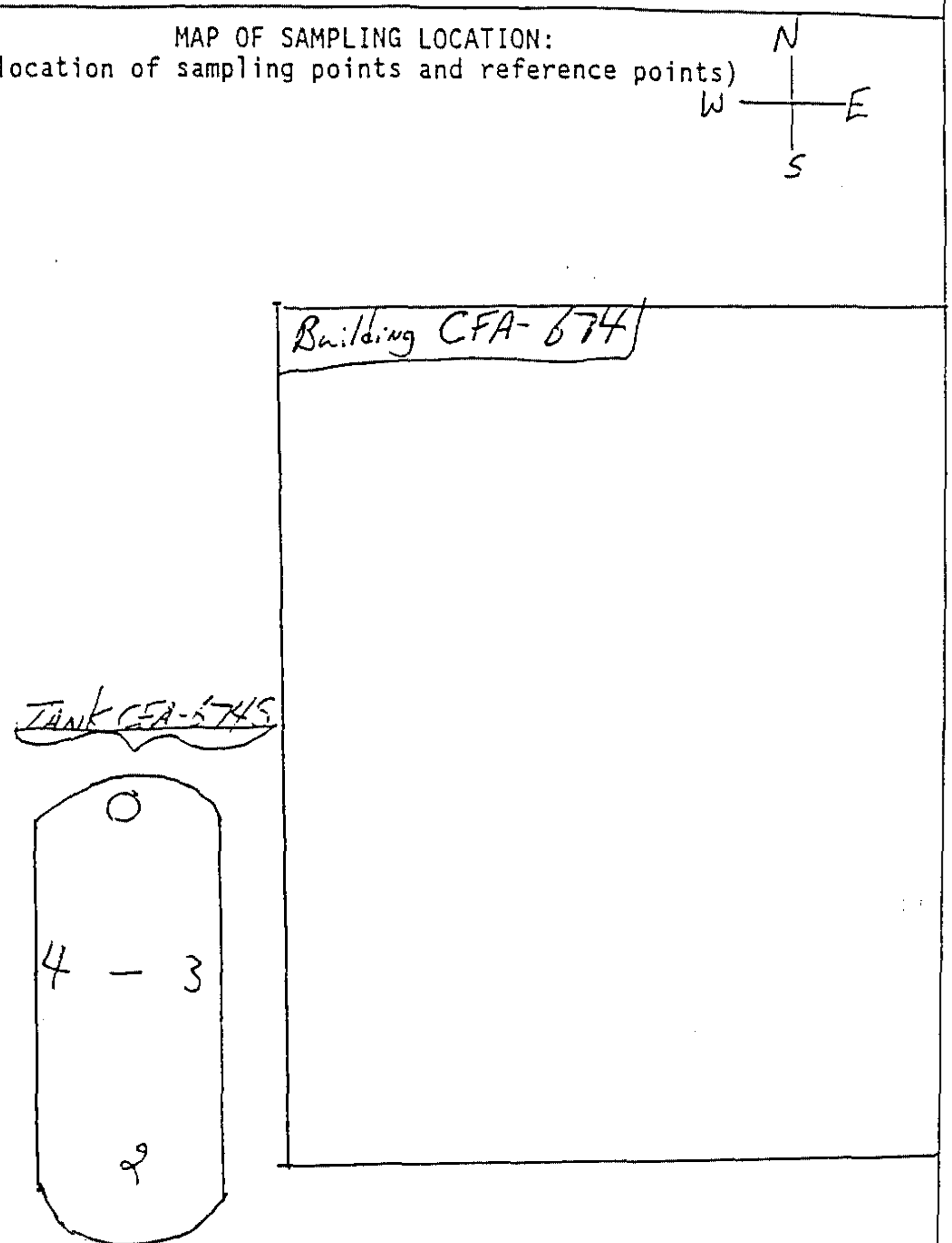
Oregon St
Miami
Ave
713
769
664
752
751
770
714
757
665
645
741
Pka 12
680
725
724
667
697
68

SAMPLE LOGBOOK

MAP OF SAMPLING LOCATION:
(include location of sampling points and reference points)



Note: Numbers indicate soil sampling locations.

RECORDED BY: [signature] QA CHECK BY: [signature]

ESTIMATION OF VOLUME OF CONTAMINATED SOIL FROM A FUEL OIL SPILL

A. S. ROOD

AUGUST 7, 1991

PROBLEM: What is the volume of contaminated soil which would result from a surface fuel oil spill of a known or estimated quantity?

ASSUMPTIONS:

- N GALLON FUEL SPILL
- SOIL POROSITY = 0.35 (ρ) (Case et al., pg A-62)
- THE RESIDUAL SATURATION CAPACITY (RS) = (0.10, 0.15, 0.20)

The residual saturation for fuel oils is approximately 33% of the water holding capacity of the soil. Dragun (1988) reports maximum RS values for different fuel oils.

Table 1. Residual Saturation (RS) values for different fuels.

Fuel	RS
light oil and gasoline	0.10
diesel and light fuel oil	0.15
lube and heavy fuel oil	0.20

The volume of soil in cubic yards contaminated by a spill is given by (Dragun, 1988)

$$V_s = \frac{0.2 \times V_{sc}}{\rho \times (RS)} \qquad (1)$$

where V_s = Volume of contaminated soil at residual saturation (yd^3).

V_{sc} = volume of discharged hydrocarbons in barrels

= (N gallons of spilled fuel) x (1 barrel per 44 gallons)

ρ = soil porosity

RS = residual saturation from Table 1

The estimated volume in cubic yards contaminated by a light oil or gasoline spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.10}$$

The estimated volume in cubic yards contaminated by a diesel or light fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.15}$$

The estimated volume in cubic yards contaminated by a lube or heavy fuel oil spill is given by:

$$= \frac{0.2 \times N/44}{0.35 \times 0.20}$$

Calculate a volume:

N = 260 gallons

RS = 0.15 (from Table 1)

Therefore:

$$V_s = \frac{0.2 \times 260 / 44}{0.35 \times 0.15} = 22.51 \text{ cubic yards of contaminated soil}$$

$= 23 \text{ yd}^3$

References:

Case, M. J., Maheras, S. J. et al., Radioactive Waste Management Complex Performance Assessment. EG&G Idaho Informal Report, EGG-WM-8773, June, 1990, Page A-62

Dragun, James, Soil Chemistry of Hazardous Materials. Hazardous Materials Control Research Institute, Chapter 2, 1988.

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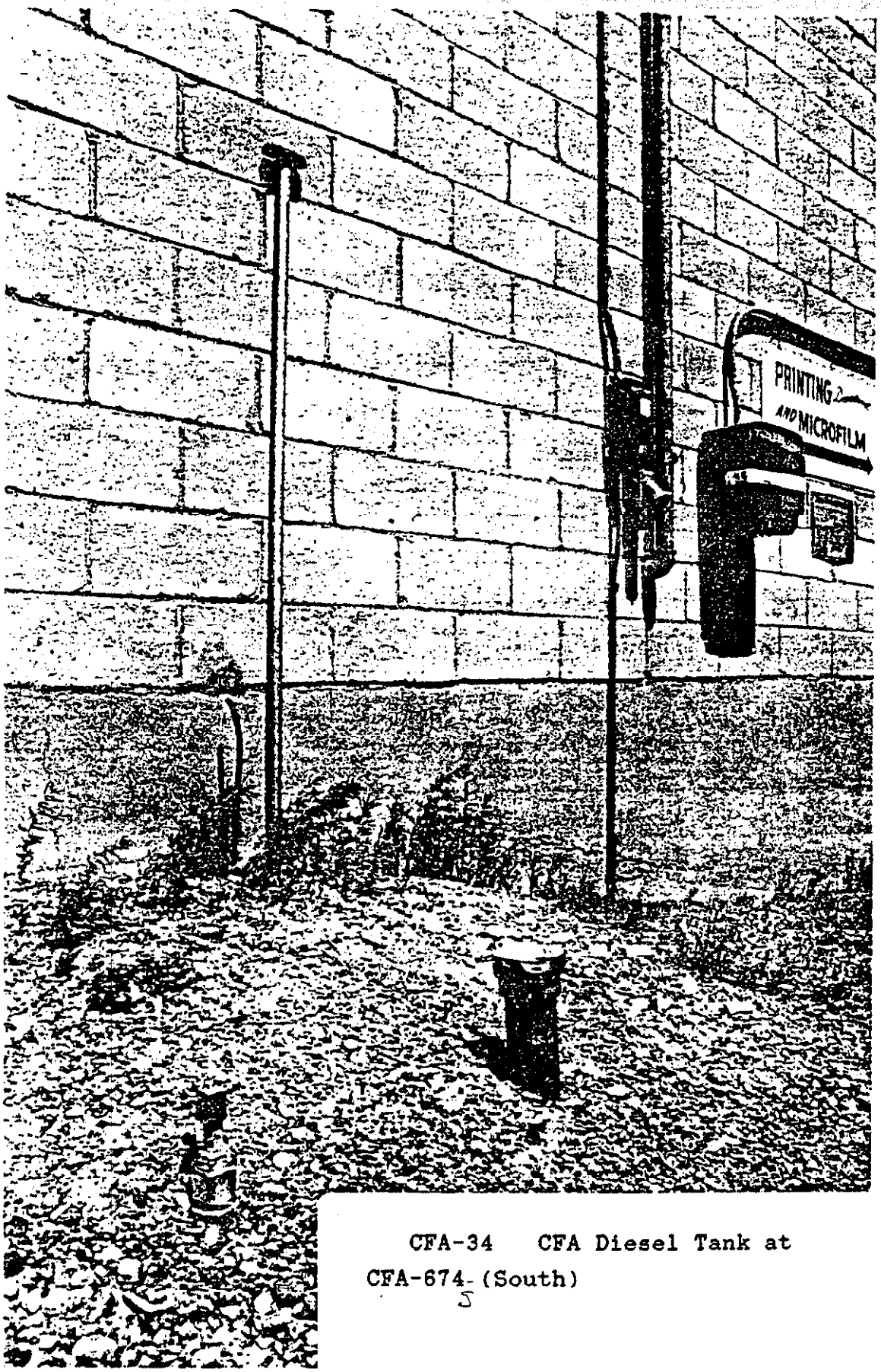
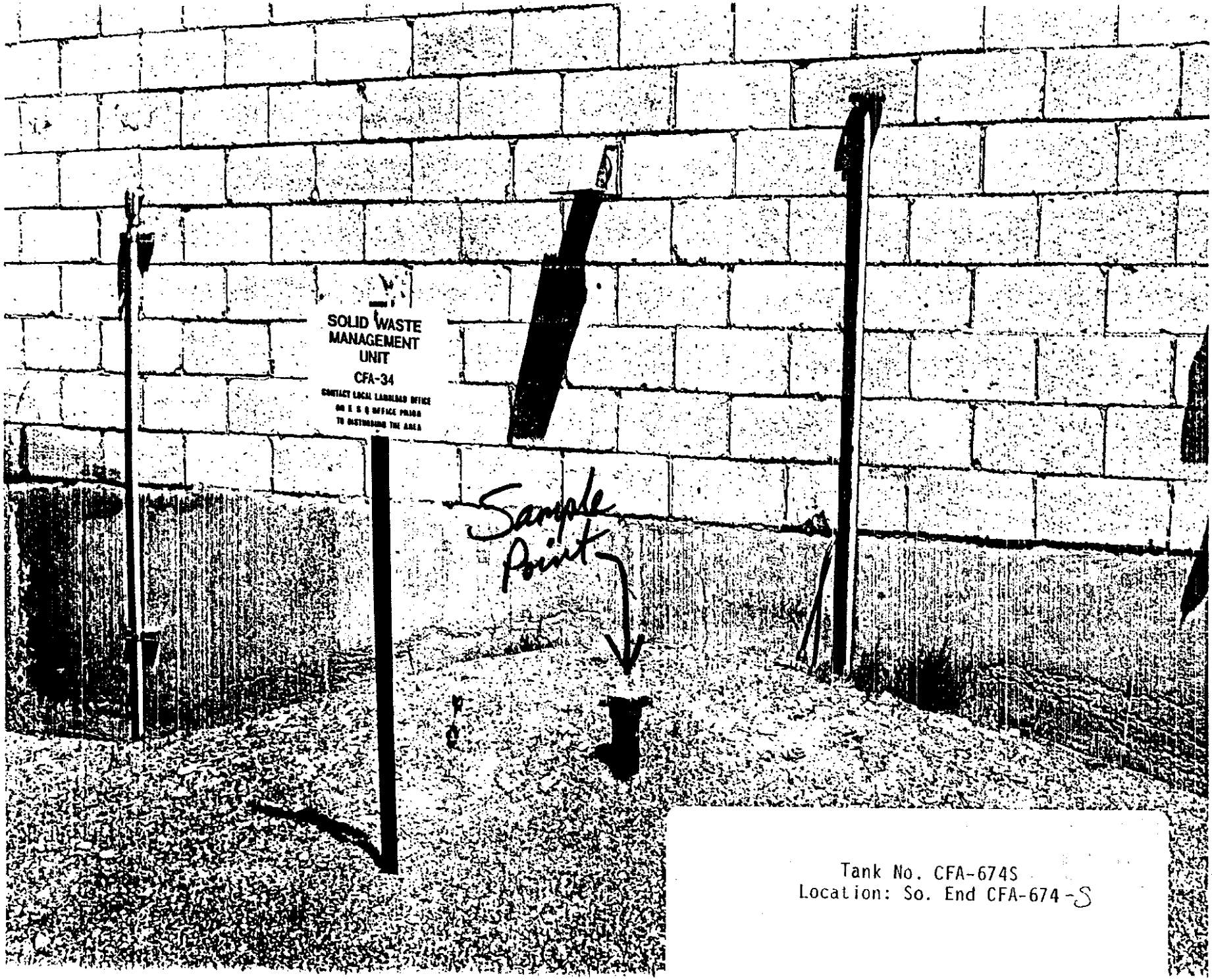


CFA-34 CFA Diesel Tank at CFA-674 (South)



Tank No. CFA-674S
Location: So. End CFA-674-S

CFA 6745


CFA
G74

DATA CHEM LABORATORIES

ANALYTICAL REPORT

Form ARF-AL

Part 1 of 1

CFA 6745

Date 11/5/90

Agency Identification Number S90-0914-BB

Account No. 03018

EG&G Idaho, Inc.
P.O. Box 1625
MS 1406
Idaho Falls, ID 83402
Attention: Vincent Daniel

Telephone (207) 525-5650

Sampling Collection and Shipment

Sampling Site UST Excavation Date of Collection October 17, 1990

Date Samples Received at DataChem October 19, 1990

Analysis

Method of Analysis CA. DHS

Date(s) of Analysis November 02, 1990

Analytical Results

Field Sample Number	DataChem Lab Number	Sample Type	TPH-Fuel Oil mg/gram							
UC26001T1	EJ 5648	SOIL	0.29							
UC26101T1	EJ 5649	SOIL	0.03							
UC26201T1	EJ 5650	SOIL	ND*							
UC26202T1	EJ 5651	SOIL	0.03							
UC26301T1	EJ 5652	SOIL	ND*							
UC26401T1	EJ 5653	SOIL	0.28							
* Limit of Detection			0.01							

* See comment on last page.
ND Parameter not detected.
NR Parameter not requested.

** Parameter not ~~analyzed~~(See comment on last page).
( ) Parameter between LOD and LOQ.

Analyst:

Reviewer:

Laboratory Supervisor:

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
A Sorenson Company

DATA CHEM LABORATORIES

ANALYTICAL REPORT

CFA 6745

Form ARF-AL
Page 1 of 1
Part 1 of 1

Date 11/5/90
Agency Identification Number S90-0914-AB
Account No. 03018

EG&G Idaho, Inc.
P.O. Box 1625
MS 1406
Idaho Falls, ID 83402
Attention: Vincent Daniel

Telephone (207) 525-5650

Sampling Collection and Shipment

Sampling Site UST Excavation Date of Collection October 17, 1990

Date Samples Received at DataChem October 19, 1990

Analysis

Method of Analysis 8020

Date(s) of Analysis October 29, 1990

Analytical Results

Field Sample Number	DataChem Lab Number	Sample Type	Benzene µg/g	Ethyl Benzene µg/g	Toluene µg/g	Xylene µg/g
UC26001T1	EJ 5648	SOIL	ND*	ND*	ND*	ND*
UC26101T1	EJ 5649	SOIL	ND*	ND*	ND*	ND*
UC26201T1	EJ 5650	SOIL	ND*	ND*	ND*	ND*
UC26202T1	EJ 5651	SOIL	ND*	ND*	ND*	ND*
UC26301T1	EJ 5652	SOIL	ND*	ND*	ND*	ND*
UC26401T1	EJ 5653	SOIL	ND*	ND*	ND*	ND*
* Limit of Detection			.05	.05	.05	.1

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.

** Parameter not analyzed(See comment on last page).
( ) Parameter between LOD and LOQ.

Analyst: Thomas N. Bosh

Reviewer: Kathleen A. Leahy

Laboratory Supervisor: Terry P. Vayo

West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
A Sorenson Company

DATA CHEM LABORATORIES

ANALYTICAL REPORT

Form ARF-C

Date _____

Agency Identification Number S90-0914-BB

General Set Comments

MATRIX SPIKE RECOVERY FOR THIS SET WAS 64.1%

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